



FENCING CONSIDERATIONS FOR LIVESTOCK OWNERS

By
Janet L. Schmidt, Whitman County Extension Director, Washington State University. **Mark D. Heitstuman**, Asotin and Garfield County Extension Director, Washington State University

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Introduction

Fencing is an integral part of a livestock or equine operation. It is very important for the safety and welfare of animals and producers. Should it fail at an inopportune time, there could be liability consequences to the animal owner or safety issues to the animal. In evaluating your fences, it could be that you need to reinforce, repair, or renovate your existing fence, or maybe you have a new area that needs to be fenced. Fencing is a major expense for livestock owners, and takes considerable time and labor. It is important to plan wisely to achieve the desired results.

The purpose of this publication is to provide producers with information to aid in the decision-making process regarding the type(s) of fencing to build or have installed. For detailed information regarding how to build or install a fence, refer to the resources at the end of this publication.

Where to Begin?

First, be clear about your objectives. Fencing is designed to keep animals in and often times to keep predators out. If this is your goal, choose a fencing system that will do this. It is much easier to select the correct fencing system in the beginning rather than modify it after it is in place. It is also important to allow for flexibility and the ability to make modifications as needs change over time. Let's say your goal is to build a cattle fence, but later you may want to add sheep or horses to your operation. Instead of building a barbed-wire fence, which is common for cattle, you may want to build a high-tensile electric fence or woven wire fence. The latter two fence options will allow for flexibility in the future.

Considerations for a fencing system include: single or multiple species use, budget, maintenance requirements, longevity, safety for people and animals, availability of materials, potential impact on wildlife, cultural norms, and building ordinances or covenants.

What if a Fence Fails?

When building a new fence or updating an existing fence, it is important to consider the potential consequences if a fence fails. The following situations warrant strong physical barriers to protect both animals and the property owner:

- Is the fence along a busy highway or road where a stray animal could potentially get hurt or cause an accident? Could you be held responsible for such an accident?
- Is the fence near a play area for small children? Or next to a neighbor's house where a stray animal could potentially hurt humans or personal property?
- Are there high-value crops, fruit trees, gardens, or expensive landscaping on the other side of the fence that could be damaged by escaped animals? Is there risk to an escaped animal's health from eating excessive stored grain and hay, or potential bloat from eating too much fresh alfalfa or clover? Or are there poisonous plants that animals could consume if a fence fails?

Animal Behavior

Different animals react differently to fencing, especially when potentially threatened by predators, or reacting to unknown circumstances. So it helps to have a basic understanding of animal behavior when planning a fencing system. Horses and cattle may try to run through or jump over a fence when chased or threatened, or try to reach over a fence when there is "greener grass" on the other side of the fence. Whereas sheep and goats may put their heads through holes and get stuck. If you select woven wire for sheep and goats, make sure the openings are no larger than two by four inches. Similarly, these small openings will prevent a hoof from getting caught if a horse paws at the fence.

Physical vs. Psychological Barriers

Fences designed as physical barriers must be strong enough to deter animals from trying to escape from the pasture or pen that they are in. Examples of physical barrier fences include barbed wire, woven wire, wooden and vinyl rails, and panels (made of heavy-gauged wire, or round/square tubing). These types of fences are built to withstand at least some pressure from livestock and horses before failing. They often include strong posts and corner bracing to keep the fence tight. Physical barrier fencing tends to require frequent maintenance and is generally more expensive than psychological barrier fencing.

Electric fences (high-tensile strength wire, braided wire/tape, portable netting, etc.) are examples of psychological barriers. Animals need to be trained to electric fencing so that they remember the unpleasant shock that they received the first time they touched a “hot wire.” One way to train animals to electric fencing is to move the animals to a secure pen with a strong physical barrier type of fence (Figure 1). Then string a “hot wire” across part of the pen, leaving a large open area (gate) on one end of the pen where animals can cross unharmed. Hay or grain can be placed on one side of the electric wire, and water on the other side. Animals will learn to go around the wire (through the “open gate”) to gain access to food or water after they have been shocked while trying to cross the “hot wire.” Fences that use psychological barriers are usually cheaper to construct and more portable and adaptable than other types of fencing.

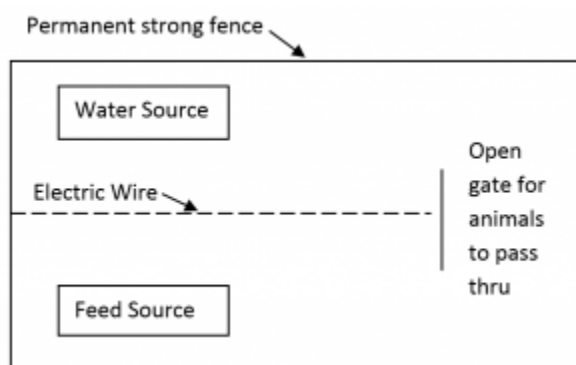


Figure 1. Training animals to an electric fence.

Human and Animal Safety

Previously we discussed fencing safety concerns for different species of animals. It is also important to remember human safety in your fence design. Young children, as well as adults, need to be warned of the dangers of receiving a shock from an electric fence; and electric fences should be clearly marked as a reminder to both farm visitors and family members. And it is important to include gates and other “escape routes” in corrals and pens that will be used to work and treat livestock.

Fencing Design

There are two major components of fencing systems: posts and barriers. Common posts for fencing include pressure-treated round or square posts of various diameters, recycled railroad ties, peeled logs, cedar posts, split posts, T-posts, and cut-to-height power poles. Each type of post has its advantages

and disadvantages. Pressure-treated wood is recommended because it will last several years longer than non-pressure-treated; however, it is more expensive and may not be able to take paint depending on the pressure treatment used. Large or tall posts, railroad ties, and power poles can be heavy to handle by hand while the hole is being dug to specifications. A small farm tractor can assist with this heavy lifting. For a wooden fence or field fence system, you will need to set several posts. It may be worth the investment to contract with a fence builder to have your posts driven in, which will result in a stronger post set. Other options include renting or buying a post-hole digger implement for your tractor and setting the posts yourself, which requires considerable time and labor. Wooden posts and planks or rails for this type of fencing are expensive in comparison to other fencing systems. T-posts, on the other hand, are lighter, easier to handle, considerably less expensive, and are driven into the ground with a T-post driver. They are not as attractive as other types of posts but can still make an acceptable and strong fence. To increase the safety of T-posts, they should be capped to prevent animals (particularly horses) from impaling themselves.

Some fences create a physical barrier while others create a psychological barrier. High-tensile and electric fence systems are considered psychological barriers. High-tensile fences are less expensive because they require fewer posts. Because this is a tension fence, it is imperative to have posts seated at least four feet deep and strong post bracing at gates and corners. Depending upon preferences and the number of strands of wire, H-brace assembly or log bed assembly are good bracing options.

A single strand of well-placed electric wire, off-set at chest height for cattle or horses, can help protect and rejuvenate a fence, preventing animals from leaning, scratching, or chewing on a fence. Likewise, a strand at the top can prevent horses or cattle from leaning over a fence and damaging the top wires or rails.

The following sections will provide a brief description of various fencing systems.

Electric Fencing Systems

Electric fences operate on the principle that when the animal comes into contact with the fence, it provides a memorable shock that is not forgotten. For this reason, electric fencing is referred to as a psychological barrier rather than a physical barrier. These fencing systems can be permanent, high-tensile, multi-strand or temporary, single-strand products that can be easily moved and reset on a daily basis. For livestock and horses, high-tensile fences tend to be four to five feet high.

These fences can also be six or more feet high and designed to exclude deer or elk to prevent damage to crops or orchards. Electric chargers and grounding are critical components for high-tensile fencing.

Notable benefits of a well-constructed high-tensile electric fence include that it will absorb the impact of an animal without causing major damage to the fence or injury to the animal. This style of fence has a “memory” so it will bounce back. It can be loosened or tightened as the need arises. Another benefit of a high-tensile fence is that it lends itself to cross-fencing. Polywire, electric tape, braid, or netting can be tied directly to the fence and strung across a pasture or area with step-in posts to allow for rotational grazing or exclusion of sensitive areas. Most high-tensile fence systems vary from three to six strands, depending upon the animal to be contained. With more strands, and the bottom strand at six inches off the ground, this fence tends to exclude predators, which is a benefit to sheep and goat producers. Disadvantages of this style of fence include that it is less visible than a traditional fence and a high vegetative load in the early spring can cause it to short out. The addition of white braid or white tape at the top of the fence can greatly enhance the visibility of the fence. Mowing, spraying, or removal of plant materials will prevent the fence from grounding out. See Figure 2 for five-strand high-tensile fence.



Figure 2. Five-strand, smooth wire, high-tensile fence. It is a psychological barrier rather than a physical barrier. Photo by Janet Schmidt.

Portable Panels

Over the past several years, portable panels have become more popular for use in paddock, pasture, and confinement situations. As the name implies, they can be picked up and moved, maximizing flexibility in facility design and animal movement. Panels come in different gauge or diameter of pipe.

Heavy weight gauge is more suitable for confining large bulls, compared to light gauge pipe that is more appropriate for sheep and goat. Sheep and goats require smaller spacing between the horizontal pieces to prevent them from escaping. Most panels have a bracket and bolt attachment that makes them easy to install and build a fence line. Common panel lengths are ten, twelve, or sixteen feet; however, they can come in custom lengths as well. With corner pieces, panels can be self-supporting for long fence runs; however, posts for additional support are recommended. Portable panel fences are relatively easy to build and install compared to many fencing systems, even though they are more expensive. Some panels have a foot support at the bottom and angle arch on the ends at the top. These types of panels can pose safety risks to horses as they can catch a hoof in the bottom support piece or catch a head at the top. See Figure 3 for portable panels.



Figure 3. Portable panels in a high traffic area. Note the roof over two of the sections. Photo by Janet Schmidt.

Woven Wire Fencing

This type of fence is frequently the fence of choice for sheep and goat owners. The rectangular squares are of a small dimension so sheep or goats will not get their head or horns stuck if they try to put their head through the fence. This style of fence requires several posts at a regular spacing of 10 to 12 feet, or at the builder’s discretion. Once built, this makes a sturdy and durable fence that will keep sheep, lambs, goats, kids, and other animals safely contained. Field or woven wire fencing is manufactured in different heights to accommodate large and small animals. Woven wire makes a good physical and visible barrier, making it safe fence design for livestock and horses. It does require good bracing at the corners and gates. For containing horses and cattle, it is advisable to add a

top hot wire and/or top board. Horses will frequently lean or rub on fencing, causing it to become misshapen; a well-placed hot wire will discourage this behavior. See Figure 4 for a woven wire fence.



Figure 4. Woven wire fencing with small openings. This style of fence is frequently preferred by sheep and goat owners. Photo by Mark Heitstuman.

Hog and Cattle Panels

Hog and cattle panels are made of heavy gauge steel 1/4 to 3/8 inches in diameter, welded together in squares. They are three to four feet high and usually come in 16-foot lengths. These panels can be nailed to posts with staples or clipped or wired to T-posts. Posts should be placed at 10 to 12 feet spacing, or at the builder's discretion. They can be installed end-to-end for long pasture runs. They should be nailed or clipped to the inside of the post so if animals push against the fence, they won't separate the panel from the post. As the name implies, this is a good fencing system for pigs and has been successfully adapted for cattle and horses. This fencing style is not recommended for sheep or goats as they can put their heads through the squares and get caught. This fencing style is fairly easy to install, lending itself to modifications when situations change. Panels make a good physical and visible barrier. If this fencing system is used for horses and T-posts are used in the construction, it is recommended to put caps on the T-posts.

Wood Fencing

When we think of wooden fences, we often think of the beautiful wooden fences that we see in the thoroughbred farms in Kentucky. These strong, durable, attractive fencing systems are built to last. The posts are frequently large in diameter, comparable to a railroad tie, planted deep in the ground, and spaced 10 or 12 feet apart. This is a relatively tall fence with four or more rails, and they can be two by six or two by eight inches in size. Thus, a several acre pasture requires many posts

and rails. Wood fencing requires frequent painting to maintain the life of the wood and the replacing of posts or rails as needed. This fence is a physical barrier, highly visible, attractive, and one of the more expensive fences to build in terms of materials and labor. It does require frequent inspection and maintenance to keep it safe and looking good. See Figure 5 for wood fencing.



Figure 5. Wooden posts and rails create a strong physical barrier for cattle and horses. Photo by Mark Heitstuman.

PVC Vinyl Fencing

In addition to being very attractive, PVC vinyl fencing is also very strong and can be used for cattle, llamas, and horses. It is very similar to wood fencing using posts and rails; however, instead of wood, it is made from PVC vinyl. Posts need to be buried in the ground at adequate depth (three to four feet) and spacing (10 to 12 feet) to make a strong fence. Depending upon the animal, three or four rails will be needed for containment. For larger animals, the fence needs to be taller. This fence system is strong, durable, very eye-catching, visible, and makes a good physical barrier. Like a wooden fence, it is one of the more expensive fence systems to build in terms of materials and time. See Figure 6 for vinyl fencing.



Figure 6. Vinyl fencing is attractive, strong, and easy to maintain. Photo by Mark Heitstuman.

Barbed Wire

Barbed wire fencing was a critical invention for ranchers in the West and helped build the cattle industry as we know it today. It is usually two strands of wire twisted together with a barb inserted at regular intervals. The barb in the wire is enough of a deterrent to keep range, roaming cattle contained in pastures. This fencing system is usually three to five strands of wire with T-posts, wooden posts, or other means to keep the fence upright. Sometimes, stays are added to the lines to add strength and prevent sagging of the wire. A barbed wire fence is adaptable to rough, rocky terrain and fairly economical to build when compared to other fencing systems. While the barbs in the wire will deter cattle, they usually don't penetrate their hide; in horses, the opposite is true. Barbed wire fence wounds to horses are very damaging and, in extreme cases, give cause to put a horse down or be lame for life. This is not a recommended fencing system for goats or sheep as well. Being a smaller animal, they can frequently slip through the wires and escape. This fence is a good barrier for cattle, is economical to install and maintain, and has good longevity.

Conclusion

Fencing systems can be adapted to meet the needs of various livestock operations. Strong, heavy-gauge panels or stout posts and wood rails lend themselves to high traffic areas like paddock or handling systems. The entrance to the home may be enclosed with white PVC fencing for the aesthetic value while field fencing is utilized in the pasture.

With a good understanding of the benefits of each fencing system, livestock owners can select a fencing system to meet their current needs and provide flexibility for the future. Now that you are equipped with basic fencing knowledge, let the construction begin.

Table 1 provides a brief comparison of fencing systems to aid in the decision-making process. The costs are estimates and do not include labor. There may be considerable regional variation in prices, products and availability.

Additional Resources

[EDEN Fencing](#)

[Electric Fencing Company](#)

[Estimated Costs for Livestock Fencing – Iowa State University Extension](#)

[Fencing Planning for Horses – Penn State University Extension](#)

[Grass Fed Solutions website](#)

[Premier 1 – General Information on Fencing](#)

[The ABCs of Electric Fencing – Michigan State University Extension](#)

[Virginia Extension Fencing Article](#)

Table 1. Comparison of fencing systems

Fencing Material	Animal	Cost per foot excluding labor	Maintenance	Longevity	Comments
High-tensile electric fencing	Cattle, sheep, horses, goats, swine, llamas	\$1-2	Moderate. Preventative maintenance advised. Check voltage output; remove vegetation from bottom wire	20+ years	Psychological barrier, predator exclusion, requires fewer posts
Portable panels	Cattle, horses, llamas	\$9–12	Minimal. Occasional adjustments	20+ years	Use heavier gauge metal for cattle/bulls. More expensive
Woven wire	Cattle, sheep, goats, horses, swine, llamas	\$2–3	Moderate. Requires many posts and frequent upkeep	10–25 years	Best with top board or electrical tape or hot wire for horses. Expensive initial cost. Holes need to be small to prevent sheep/goats from getting heads caught.
Hog or cattle panels with T-posts	Sheep, goats, swine, horses, llamas	\$2–3	Moderate. Check on a regular basis, will rust if in contact with soil	10–25 years	Use caps on T-posts for safety, particularly with horses. Use panels with smaller squares for sheep and goats.
PVC vinyl	Horses, llamas, cattle	\$4–5	Minimal	10–20 years	Attractive, visible, moderate Expense. May require one hot wire.
Wood fencing (rails, split cedar, etc.)	All classes depending on board spacing	\$3.50–10	Moderate. May require board or post replacement and painting	10–30 years	Expensive, attractive, visible. Electric wire will extend longevity. Horses may chew.
Barbed or barbless wire	Cattle	\$1	Minimal	15–25 years	Can use T-post to reduce cost. Can cause injury to animals and humans.

Table adapted from “Field Guide to Horse Fencing” by Gavin Ehringer, Horse and Rider Magazine, May 2012. Reviewed by John Pearson, owner of Pearson Farm and Fence in Colfax, WA.



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